



United States
Department of
Agriculture
Forest Service

FOREST PEST MANAGEMENT

Technology Update

Southern Region, USDA Forest Service, 1720 Peachtree Rd., N. W. Atlanta, Ga. 30367

Forestry Pesticide Fact Sheet No. 3

COMPARISON OF EIGHT HERBICIDES FOR CONTROL OF TURKEY OAK

Tree injection is the most widely used method to apply an herbicide to individual trees. Users of this method may be faced with two problems — resprouting, and uncertainty about the length of time required for the herbicide to kill the tree. Quickness of kill is a major factor that private landowners and foresters use to rate the effectiveness of a herbicide.

This fact sheet discusses a study of both the speed of action and the effect on resprouting of eight herbicides recently tested on turkey oaks. Costs were also considered. The oaks ranged from 3 to 16 inches in diameter at breast height (d.b.h.), and from 10 to 70 feet in height (Cantrell 1984).

Three herbicides did the best job of killing the trees: 2,4-D; triclopyr; and hexazinone (liquid). Of these, 2,4-D was judged the most cost-effective herbicide for control of turkey oak in the sandhills of the Southeast (Cantrell 1984). Injection with 2,4-D may cost \$2 per acre less than triclopyr or \$11 per acre less than hexazinone (liquid).

Herbicide users should be aware that the cost per gallon of a particular herbicide does not constitute a valid cost of the treatment in place. Many variables, including dosage rate, effectiveness, number of injections (frequency), and labor costs must be considered before selecting the most cost-efficient herbicide treatment.

Materials Tested

The injected herbicides included dicamba (Banvel CST), 2,4-D (DMA 4); triclopyr (Garlon 3A); glyphosate (Roundup); 2,4-D + picloram (Tordon RTU); hexazinone (Velpar L); and dichlorprop (Weedone 2,4-DP). These herbicides were applied undiluted at a rate of 1 ml per incision. The incisions were 2, 3, or 4 inches apart, edge-to-edge,

and were made near the root collar. A commercial injector equipped with a 1-inch-wide bit was used in these tests.

Hexazinone (Velpar Gridball) was applied in pellets containing 10-percent active ingredient. Two pellets per inch of d.b.h. were placed by hand near the root collar of each treated tree (table 1).

Timing

All herbicides were applied in early June, 1982. Two treated trees and one untreated tree from each plot were felled 2, 4, 8, and 12 months later. Stumps were then tagged and monitored for sprouting. Herbicide effectiveness was determined by assessing the percent of crown defoliation and refoliation of standing trees, and sprouting following cutting over a period of 16 months.

The herbicides differed significantly in speed of action. Based on defoliation ratings for the first 4 months, the herbicides were grouped into three categories: very fast-acting (hexazinone liquid); fast-acting (glyphosate, 2,4-D, triclopyr, 2,4-D + picloram); and slow-acting (dichlorprop, dicamba, hexazinone pellet). After 1 month, hexazinone (liquid) treated trees had completely defoliated and refoliated. The new leaves showed symptoms of herbicide damage (table 1).

Resprouting

Stump sprouting was significant after 11 months on trees treated with hexazinone (both liquid and pellets) and dicamba. However, at the end of 16 months, live sprouts grew only on stumps from trees treated with dicamba and the hexazinone pellets. Uncut trees treated with dicamba, glyphosate, or hexazinone pellets were also resprouting after 16 months. All herbicide treatments produced significantly fewer sprouts than the check treatment. At the end of 16 months, significant refoliation occurred on trees treated with hexazinone (pellets), dichlorprop, and dicamba (table 1).

References

Cantrell, R.L. The effects of eight herbicides on turkey oak (*Quercus laevis* Walt.) topkill and sprouting. Gainesville, FL: University of Florida; 1984. 132 p. M.S. thesis.

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Caution.—Use pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers. Some States have restrictions on the use of certain pesticides. Check your local and State regulations. Also, because registrations of pesticides are under constant review by the Environmental Protection agency, consult your State forestry agency or county agent to be sure the intended use is still registered.

Table 1.—Application rates and efficacy data for eight herbicides tested as individual tree treatments for control of turkey oak¹

Herbicide		Manufac- turer	Incision spacing ² (inches)	Rate ³ (ml)	Percent defoli- ation ⁴	Percent refoli- ation ⁵	Sprouts per cut tree ⁶	Percent of uncut trees sprouting ⁷
Trade name	Common name							
~~2,4-D~~	DMA 4 [†]	Dow	3	1	100	0	0.1	2.9
~~2,4-D~~ + picloram	Tordon RTU	Dow	3	1	92	06	0.2	2.9
Dicamba	Banvel CST	Velsicol	2	1	75	17	2.2	37.1
Dichlorprop	Weedone 2,4-DP	Union Carbide	2	1	74	11	0.5	5.7
Glyphosate	Roundup	Monsanto	4	1	97	02	0.4	20.6
Hexazinone	Velpar L	Dupont	4	1	100	0	0.1	2.9
Hexazinone	Velpar Gridball [†]	Dupont	*	*	98	22	1.3	8.6
Triclopyr	Garlon 3A	Dow	3	1	100	0	0.0	0.0
Check [§]	—	—	—	—	—	—	6.2	0.0

¹Efficacy data taken from Cantrell, 1984, and two manuscripts in review.

²Measured edge-to-edge.

³Undiluted herbicide per incision.

⁴One growing season after application.

⁵Two growing seasons after application.

⁶Average number of sprouts per cut tree 16 months after herbicide treatment.

⁷Percentage of uncut trees that were sprouting 16 months after herbicide treatment.

†Product has been discontinued; however, similar products with the same active ingredient are available.

*Two 1-cc pellets per inch of d.b.h. placed near the root collar of each treated tree.

§No herbicide treatment; an equal number of check trees were felled for sprouting comparisons.